

**BISPORANGIATE ANOMALOUS SPOROPHYLLS IN ISOËTES FROM RAJASTHAN**—The presence of a solitary, adaxial sporangium on or in association with a sporophyll is the fundamental feature of all lycopods. Only two exceptions have been reported. The fossil *Lycostachys protostelicus* was described by Pant and Walton (*Palaeontographica* 108:1–10. 1961) as having two subarchesporial pads in a sporangium; and in *Isoëtes indica*, Pant and Srivastava (*Proc. Natl. Inst. Sci., India, B, Biol.* 23:242–280. 1962) described sporophylls having two, almost equally developed sporangia. The discovery of bisporangiate sporophylls in two additional species of *Isoëtes*, *I. coromandelina* L. f. collected at Poasa near Jaipur, Rajasthan, and in an apparently new species of *Isoëtes* from Mt. Abu, Rajasthan, India, are additions to this list.

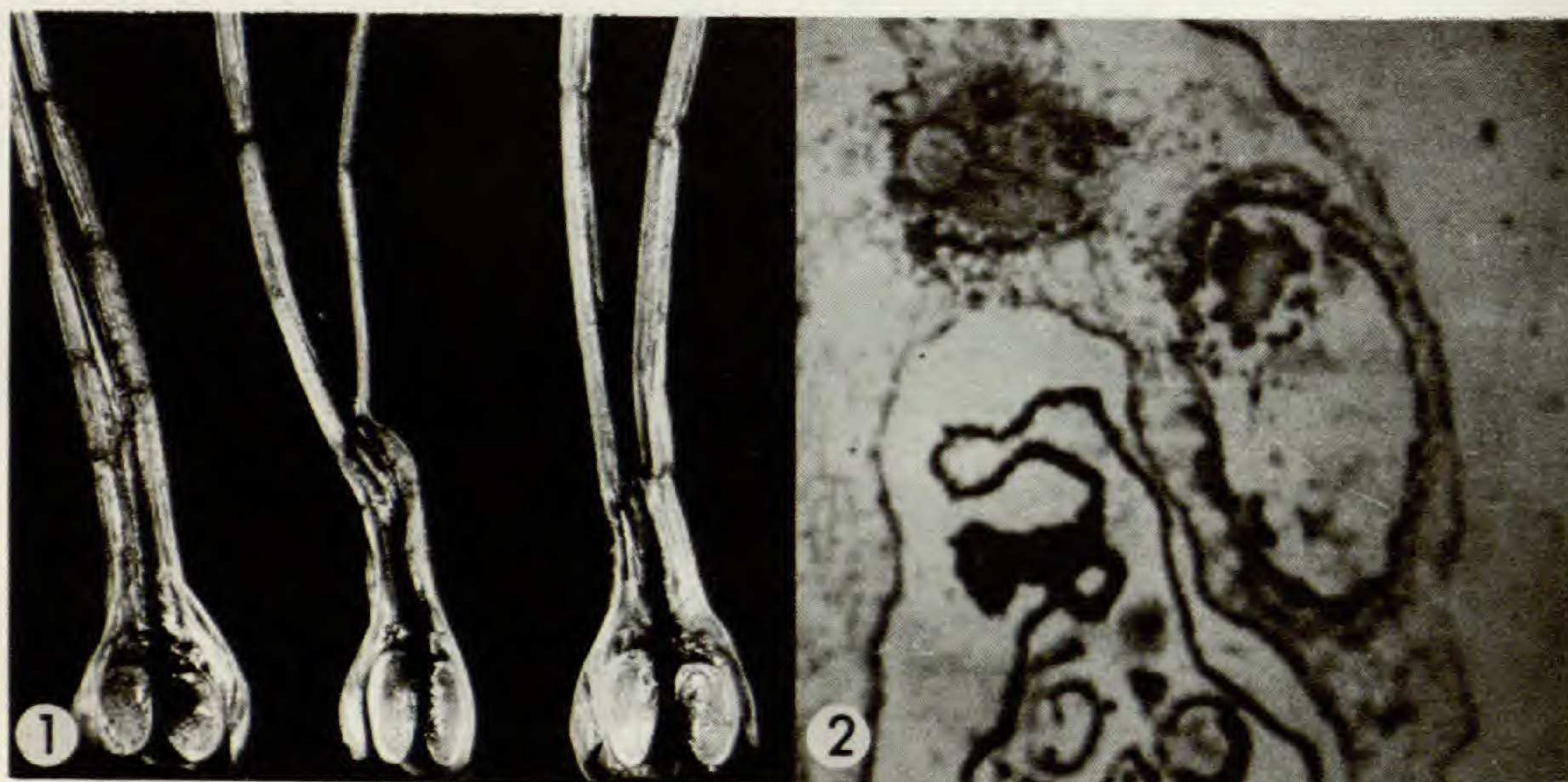


FIG. 1. Bisporangiate, abnormal sporophylls of *Isoëtes coromandelina*,  $\times 1.2$ . FIG. 2. Longisection of bisporangiate sporophyll of *Isoëtes* sp. from Mt. Abu showing two unequal sporangia,  $\times 20$ .

A number of abnormal sporophylls were discovered in *I. coromandelina* which possess double sporangia (*Fig. 1*). These seem to be produced by fusion between adjacent sporophylls during their development. The proximal portions of the sporophylls are united and bear two sporangia; the distal, acicular portions of the sporophylls are free. The ligules and upper labia are also double. However, in other details of morphology and anatomy the sporophylls are normal.

In the *Isoëtes* from Mt. Abu, an abnormal sporophyll bearing two sporangia was discovered during sectioning of the material. The two sporangia are unequal and are separated by a partitioning wall (*Fig. 2*). The smaller sporangium is empty and seems to be a bud-like, sterile structure; the bigger one is normal and contains numerous megaspores.

From the present discovery, it seems that double sporangia are not so rare in *Isoëtes*. Further investigations are needed to establish any possible phylogenetic conclusions.—*B. D. Sharma, R. Singh, and D. R. Bohra, Department of Botany, University of Jodhpur, Jodhpur 342001, India.*